

Ecosystems

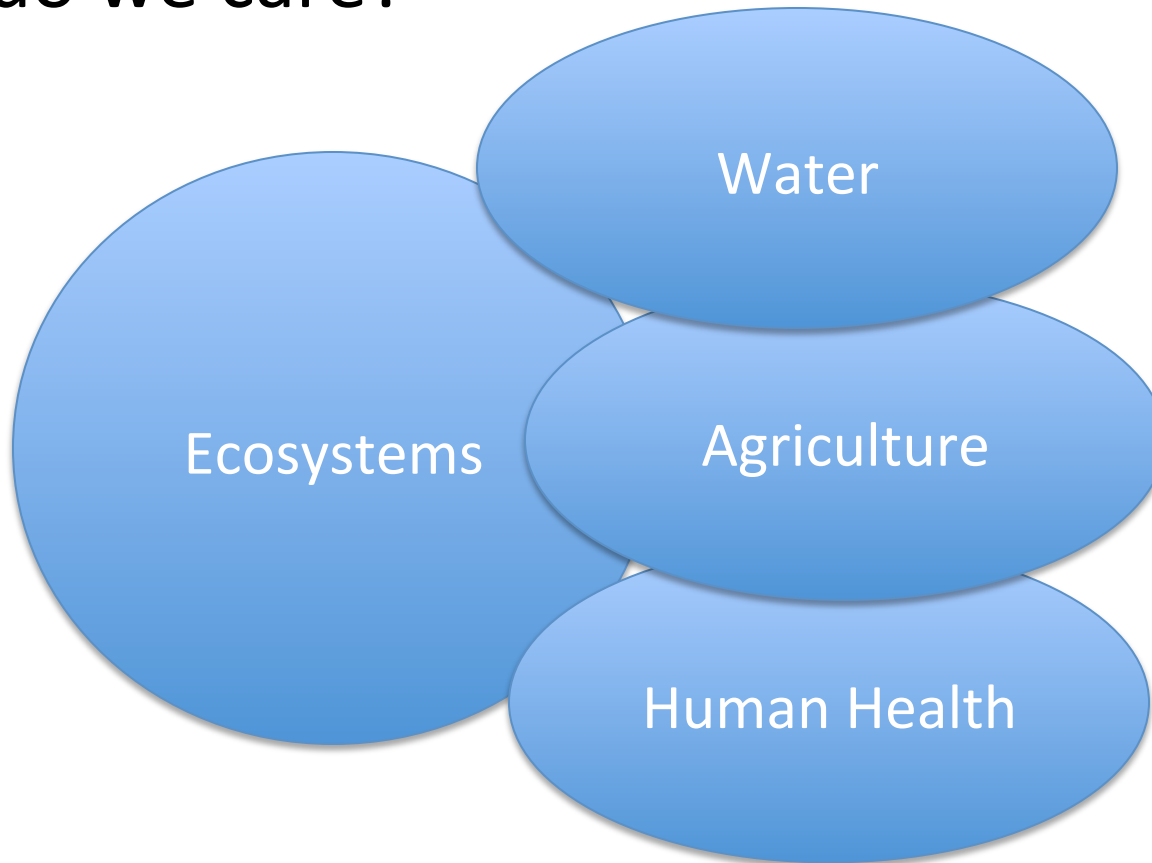
Ecosystems

Why do we care?



Ecosystems

Why do we care?



Three Key Findings

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Species Shifts

Many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal activities, migration patterns, abundances, and species interactions in response to ongoing climate change

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Extinction Risks

A large fraction of both terrestrial and freshwater species faces increased extinction risk under projected climate change during and beyond the 21st century, especially as climate change interacts with other stressors, such as habitat modification, over-exploitation, pollution, and invasive species

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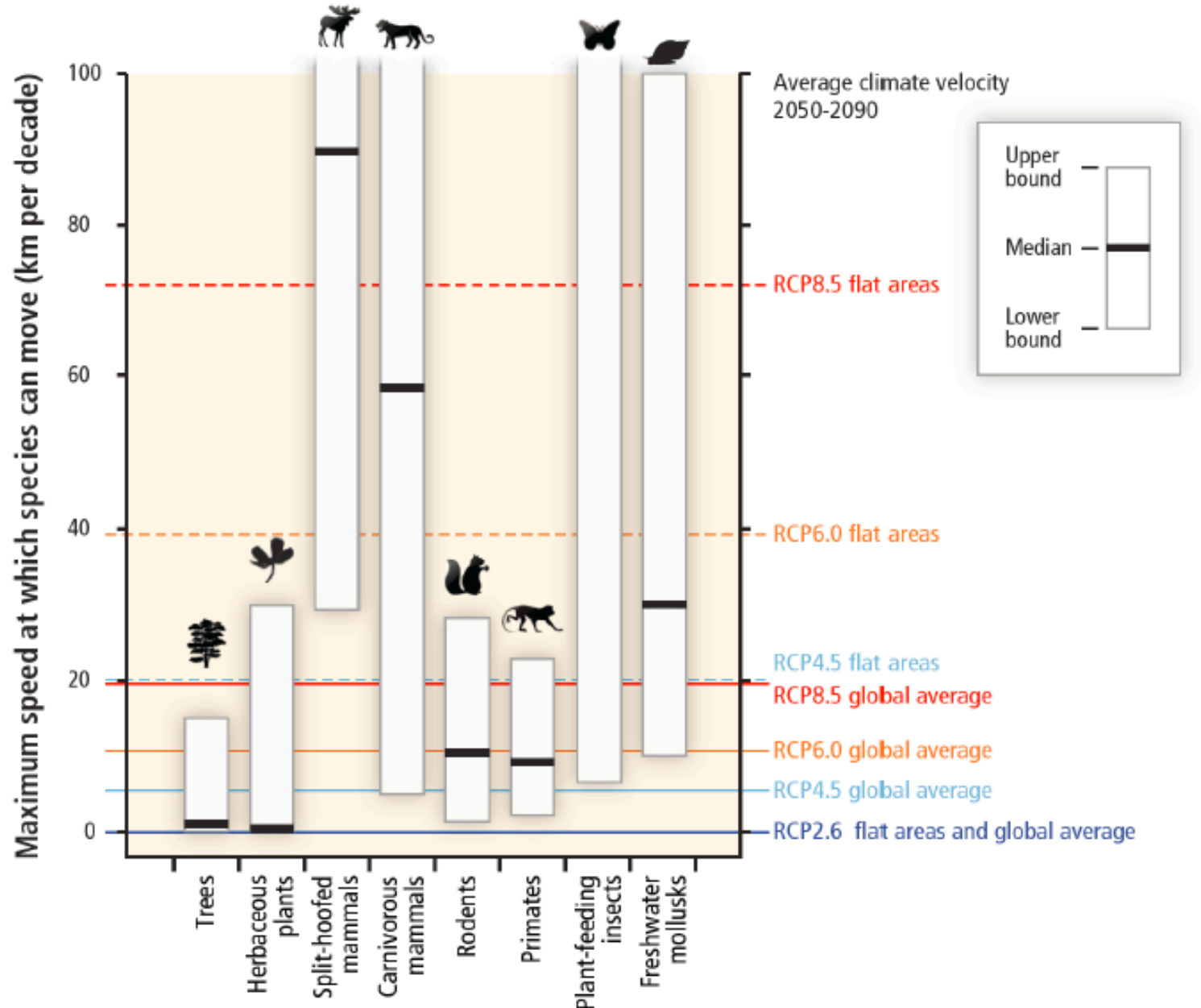
Extinction Risks

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Ecosystem Change

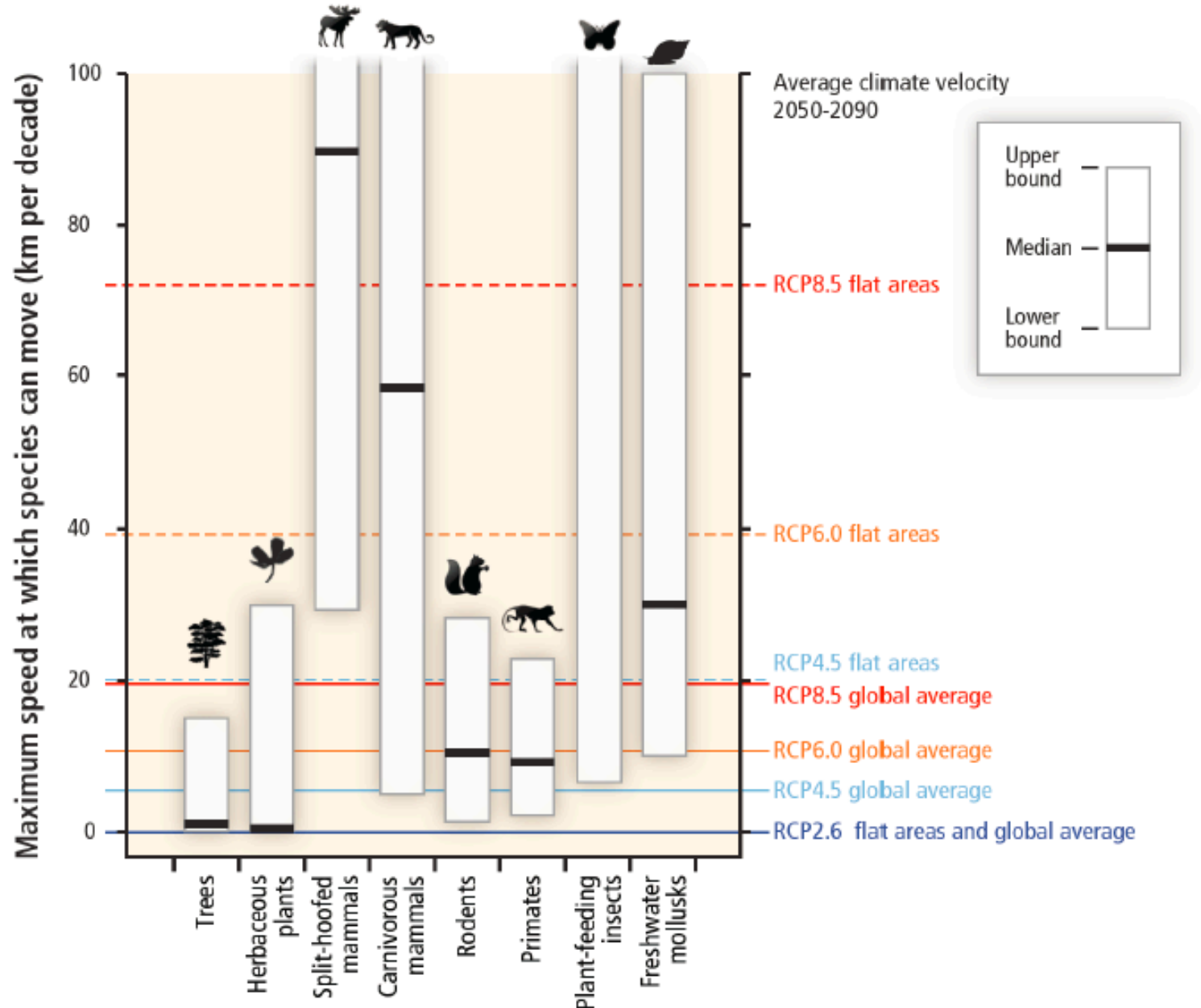
Within this century, magnitudes and rates of climate change associated with medium- to high-emission scenarios pose high risk of abrupt and irreversible regional-scale change in the composition, structure, and function of terrestrial and freshwater ecosystems, including wetlands

Can species move fast enough?



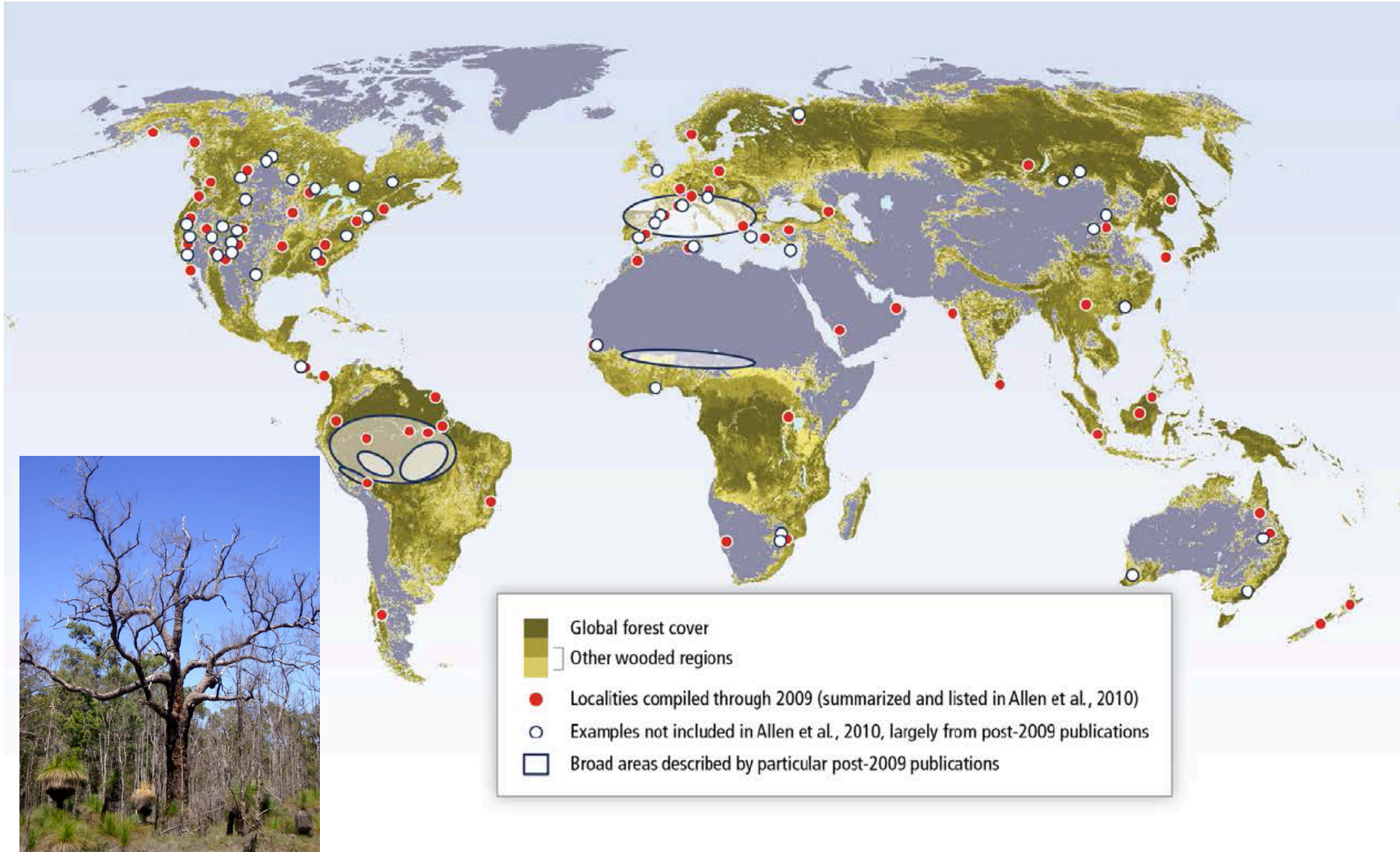
Can species move fast enough?

Depends on how much it warms



Lots of New Information

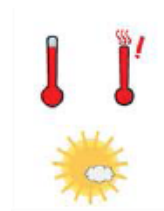
Example: Forest die-back



Key Risk

Reduction in terrestrial carbon sink

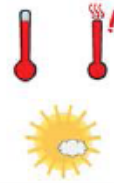
Climate Drivers



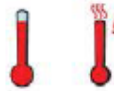
Key Risk

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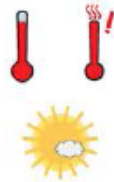
Reduction in terrestrial carbon sink



Boreal tipping point



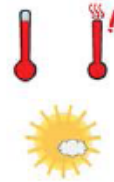
Amazon tipping point



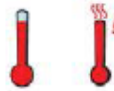
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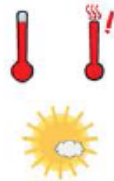
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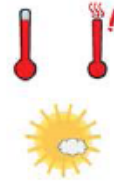
Tree mortality and forest loss



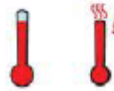
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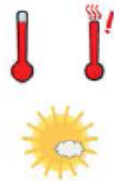
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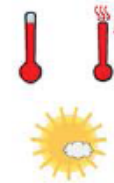
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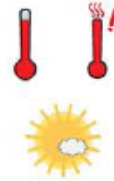
Increased risk of species extinctions



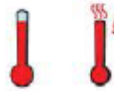
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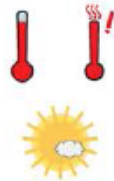
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Invasion by non-native species

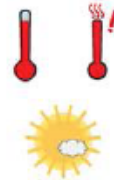


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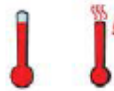
Adaptation Issues & Prospects

Reduction in terrestrial carbon sink



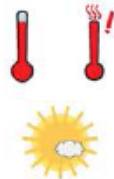
Managing land use, fire, & non-climatic stressors

Boreal tipping point



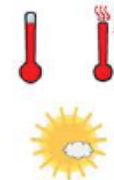
Few options in Arctic

Amazon tipping point



Policy & market change to reduce deforestation & fire

Tree mortality and forest loss



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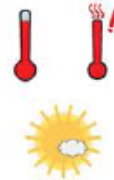


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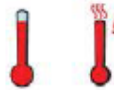
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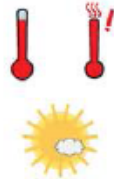
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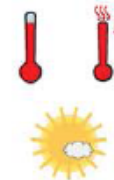
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More management of fire, pests & pathogens

Increased risk of species extinctions



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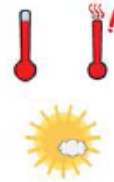


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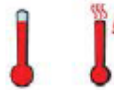
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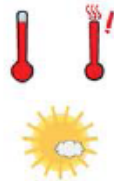
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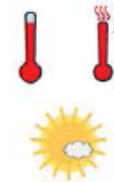
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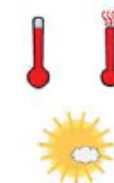
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Reduce habitat change, pollution, over-exploitation, invasives; expand protected areas; assisted dispersal; ex situ conservation

Invasion by non-native species

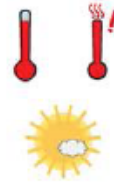


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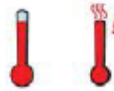
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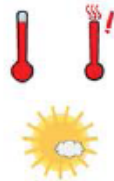
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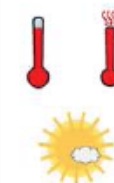
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Invasion by non-native species



Reduce other stressors to slow arrival; direct control if feasible

A Key North American Risk



Wildfire

Wildfire-induced loss of ecosystem integrity, property loss, human morbidity, and mortality as a result of increased drying trend and temperature trend

Relevance to the Southwest



Wildfire

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Wildfire

Fuels reduction treatments

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Wildfire

Fuels reduction treatments

Plant Mortality

Relevance to the Southwest

Wildfire

Fuels reduction treatments

Plant Mortality

Grazing drought mitigation via
grass banks

Relevance to the Southwest

Wildfire

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Invasive Species

Relevance to the Southwest

Wildfire

Fuels reduction treatments

Plant Mortality

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Invasive Species

Active removal
of buffelgrass

